

Accelerator Systems Division Highlights Ending August 12, 2005

Installation

Craft Snapshot 8/2/05

ASD productive craft workers	45.0
Foremen (Pd by 15% OH)	5.0
HSM management (Pd directly)	3.0
TOTAL AMSI WORKERS	53.0
Less WBS 1.9, 1.2 etc	7.0
Less absent	4.0
TOTAL PD BY ASD/ORNL DB WPs	34.0

Accelerator Physics

- The physics group is covering 24x7 shifts for SCL commissioning.
- Two rounds of SCL tuning have been performed. The first tuneup used cavity gradients at 60% of their field emission limits and reached an output energy of 555 MeV. A second tuneup at higher gradients reached an output energy of 820 MeV. The beam pulse at present is 20 mA peak current, 20 microseconds and 1 Hz.
- Two new applications were tested and utilized for the SCL tuneup. An energy management program designs linac lattices given constraints on cavity gradients and performance. A phase scan application (SLACS) uses downstream BPMs to determine the input energy, cavity field amplitude and phase. Both applications have been essential for the SCL tuneup

Operations:

- Operated the LINAC for Commissioning studies, achieving 557 MeV at the LINAC dump.
- Ran Beam Loss Studies to validate the Accelerator Physics Beam Loss Model and radiation calculations.
- Began writing the microscopic facility operating schedule for the period from CD-4 to the end of FY 06 and all of FY 07
- Completed the ASD Group-Subgroup-Subsubgroup structure for the integration of DataStream, ProjectWise, and the SNS E-log and ASD Operations Beam Time Reporting software structures.

Ion Source

- The Frontend ion source continues to deliver the requested beam current. We assisted operations only on Saturday morning, when the source would not start with 400 W of 13 MHz and a gas puff just below the trip level of the BBB safety chain. However, when the 2 MHz was raised to 30 kW the source self-ignited and worked just fine.
- We are preparing the acquisition of high priority spares and emittance scanners so that the orders can be placed early in FY'06.

Survey and Alignment

RING:

Mapped flanges and fiducials on upstream extraction kicker

Mapped flanges and fiducials on downstream extraction kicker

RTBT:

21Q40 final alignment: QV03, QH04, QV05, QH06, QV07, QH08, QV09, QH10, QV11

Leveled rad-hard mockup stand in the north target hall in preparation for grouting

Angle observations made between RTBT network and sticky target on the nose of the target module

TARGET:

Set position for BL2 alignment mirror fixture

Installed BL2 alignment mirror fixture

Hot Cell mercury pump survey (Tracker had to be moved and placed then removed... a significant job in itself)

Mic guide pin hole diameters on mercury pump mounting plate

Angle observations made between RTBT network and sticky target on the nose of the target module.

Verification measurement taken on shine shield shelf

Comparison between optical level and height gauge/zerotronic level in XFD lab for setting granite tiles on BL4

BL13 25 points set out with chalk lines for concrete work

Core vessel settlement monitoring monument placement reconnaissance

Magnet Measurement:

30Q44_03 fiducialized

21Q40_23 coupled with corrector DCV036 (This marks the end of M. Measure work on 21Q40s)

Miscellaneous:

Tracker 784 intermediate alignment, IFM, ADM, and reflector check calibrations performed

Mechanical

Magnets

Water Systems Installation

- The repaired pump for the Ring magnet cooling system was reinstalled and returned to operation.
- The main Ring dipole buss cooling lines modifications were completed and leak checked.
- The Ring magnet cooling lines were checked for leaks and the units released for testing.
- Installation of the Ring Collimator cooling system pneumatic lines continued.
- Fabrication of the RTBT/Target Quad cooling manifold continued.
- Preventative Maintenance on the Linac water systems continued.

Ring Systems Installation

- A Ring and RTBT beamline vacuum seal inventory was conducted and a procurement list compiled.
- The Ring magnets' power buss interconnection tightness was verified on the BNL assembled units.
- The RTBT/Target Duratek large shielding blocks were relocated to the storage area at the west end.
- The RTBT/Target quad magnets' pit #2 was cleaned and painted to minimize future contamination in that area.
- The RTBT/Target quad magnets' pit #2 shielding bottom plates were removed and the concrete floor lintels reinstalled.
- The RTBT/Target quad magnets' assembly/test stand was aligned and grouted.
- The RTBT/Target quad magnets' assembly/test stand rails were installed.
- The RTBT/Target quad magnets were relocated to the North side of the target building for assembly.
- The RTBT/Target flight tube was leak checked.
- Four RTBT WS Diagnostic chambers were installed.
- Three RTBT BCM Diagnostic assemblies were installed.
- The RTBT 21Q40 magnet assembly QH14 was delivered to the tunnel.
- The last RTBT 21Q40 magnet assembly QV13 was assembled.
- Mapping continued on the RTBT 30Q44 magnet assemblies.

Electrical

- The integrated tests of the 8 Ring Injection Kicker power supply/magnet tests are complete except for the heat runs, which will be performed on 8/15/05. This include successful integration with the EPICS control systems and operation of all 8 power supplies/magnets simultaneously.
- All pre-test checkouts of the Ring Main Dipole power supply and the 6 Ring Main Quadrupole Supplies are complete and testing of these supplies will commence on 8/15/05. The tests are scheduled to last 2 weeks, or until 8/29/05, and access to the ring will be limited to only some of the members of the Electrical Systems Group during this period.
- Ring BPM and BCM cable pulls are complete.

HPRF

Ring RF

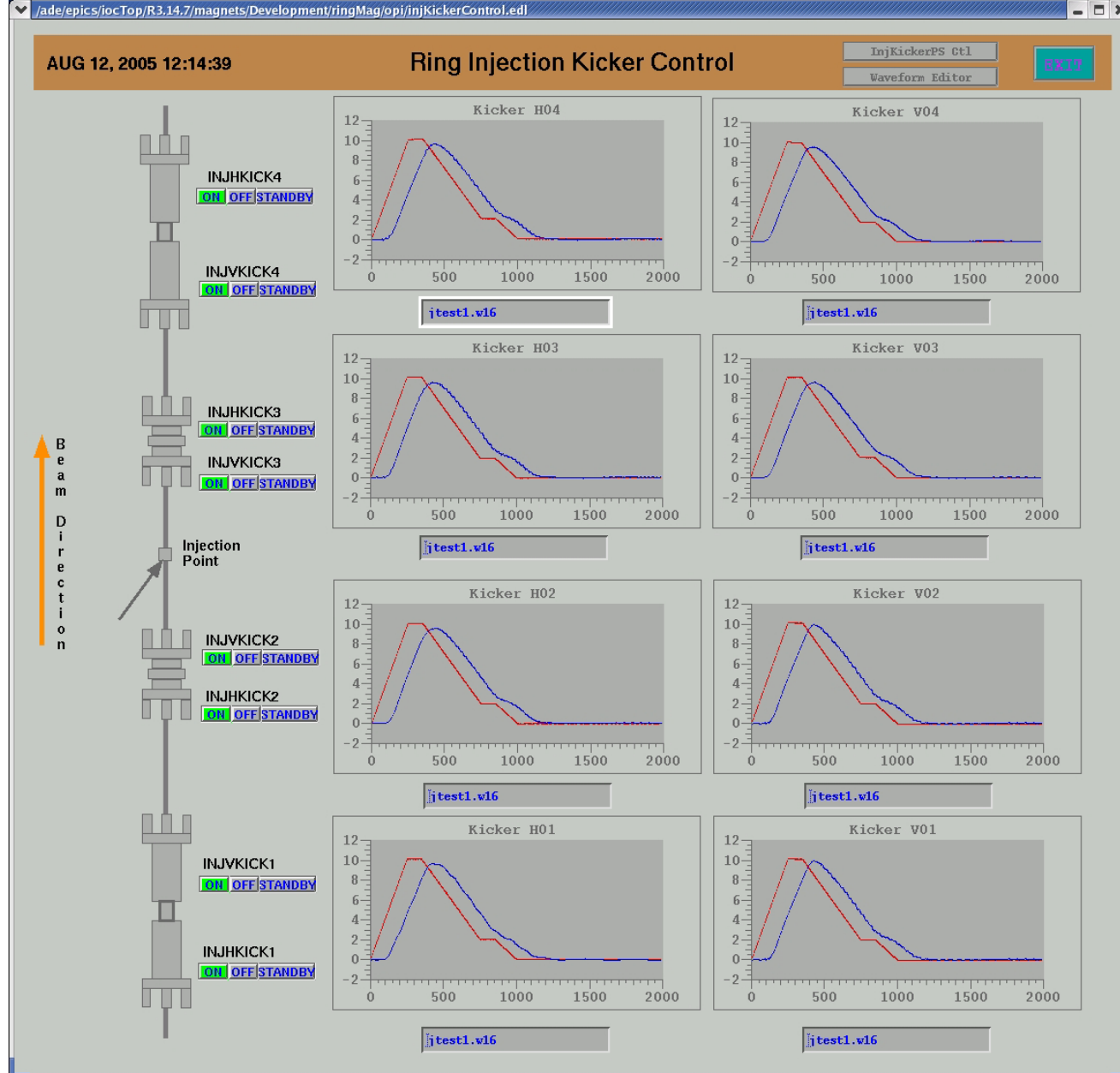
- AC Power has been checked out and is now available.
- Checkout/Testing of Station 21 configured as a 1st harmonic station has begun.
- Preliminary EPICS Controls checkout has begun

LLRF

Cryo Systems

Controls

- The Ring HPRF IOC and PLC interface was tested. The first Ring LLRF IOC was set up. Timing and DSP executables are needed to continue progress on this front.



Ring Injection Kicker Power Supply controls were completed this week. A 60 Hz pulse generator was used to simulate the timing signal and all 8 kicker magnets were pulsed with the test waveforms as shown below. (Input waveform in red and readback waveform in blue.) The Ethernet and processor modules for all DTL and CCL RCCS PLC systems were updated with the latest firmware. The PLC code was updated to version 13 and the auto-fill feature was added to all RCCS and QMCS PLCs.

- A Ring/RTBT vacuum system installation schedule was developed and presented at the weekly ASD installation meeting. The schedule highlights a number of issues that need to be resolved in order to meet the Ring ARR date.
- LEPT chopper controls development continues. The controller FPGA and enclosure design are in progress. We are coordinating with the Electrical Group regarding design/modification/installation of new switcher/controller racks adjacent to the source.
- The Controls Group FPGA expert was called in to consult on Diagnostics timing card issues. An investigation of the timing card Event Link and RTDL circuits was conducted. Lab experiments and transmission line analysis were conducted to determine behavior of circuits. A first round of board modifications to improve transmission line matching was proposed. We coordinated with lab techs to get boards modified for immediate field installation.
- The Ring PPS access control system was functionally tested and approved for use. This functionality is a prerequisite for magnet power supply testing next week. Other PPS progress included work on the Target PPS (TPPS) design and installation, modifications to the HEBT PLC-C to make more data available to EPICS and programming for the chipmunk test station. An ORNL badge reader has replaced the old badge reader in the Linac entry station.
- A timestamp was added to the IOC heartbeat error latch, so we can now tell exactly when an IOC went down, either briefly or for a reboot.

- Larry Hoff of BNL presented information on the BNL "sequencer". This led to a discussion of ideas for a "Recipe" handler that allows automation of simple tasks without much programming, suitable for operators. Examples include shutdown of several cavities, recovery from certain trips, reboot of several systems, etc. Tom Pelaia will look into implementing this as an XAL application.
- The MEBT and all Linac LLRF IOCs were updated with software that provides more specific HPM error indication and hopefully reacts smoother to phase setpoint changes.

Beam Diagnostics

BPMs

BCMs

BLMs

Foil video